



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/666,420	09/20/2000	Hoanh Nang Pham	06052 USA	5993

23543 7590 06/30/2003

AIR PRODUCTS AND CHEMICALS, INC.  
PATENT DEPARTMENT  
7201 HAMILTON BOULEVARD  
ALLENTOWN, PA 181951501

EXAMINER

RIDLEY, BASIA ANNA

ART UNIT	PAPER NUMBER
----------	--------------

1764

DATE MAILED: 06/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/666,420

Applicant(s)

PHAM ET AL.

Examiner

Basia Ridley

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 April 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Drawings*

1. The corrected or substitute drawings were received on 14 April 2003. These drawings are acceptable.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim(s) 1-8, 11-18 and 21-22 is/are rejected under 35 U.S.C. 102(b) as being anticipated by Ohsaki et al. (USP 5,199,961).

Regarding claim(s) 1-8, 11-18 and 21-22, Ohsaki et al. disclose(s) similar apparatus comprising:

- a vessel (410) having at least one partition wall (27) disposed in said vessel (410), said at least partition wall (27) dividing said vessel into a plurality of chambers, including at least one combustion chamber (110) and at least one convection chamber (120), each of said chambers having a first end and a second end opposite said first end;
- at least one burner (50) disposed in said at least one combustion chamber (110), said burner (50) adopted to combust a fuel, thereby generating a flue gas having sensible heat;
- communication means (27) between said at least one combustion chamber (110) and said at least one convection chamber (120) whereby at least a portion of said flue gas flows from said at

Art Unit: 1764

least one combustion chamber (110) to said at least one convection chamber (120) at a first location adjacent said first end of said at least one convection chamber (120);

- transfer means (Fig. 1) whereby at least a portion of said flue gas flows to a second location in said at least one convection chamber (120) adjacent said second end of said at least one convection chamber (120);
  - a first reaction chamber (10) adapted to receive a first portion of a mixed-feed, a substantial portion of said first reaction chamber (10) disposed in said at least one combustion chamber (110);
  - a second reaction chamber (10) adapted to receive a second portion of said mixed-feed or another mixed-feed, a substantial portion of said second reaction chamber (10) disposed in said at least one convection chamber (120);
  - wherein said first and second reaction chambers are reforming reaction tubes (Abstract); and
  - communication means between said first reaction chamber (10) and said second reaction chamber (10), whereby a fluid flows from or to said first reaction chamber (10) to or from said second reaction chamber (10);
  - wherein the substantial portion of said first reaction chamber (10) is substantially vertical within said at least one combustion chamber (Fig. 1);
  - wherein the substantial portion of said second reaction chamber (10) is substantially vertical within said at least one convection chamber (Fig. 1);
  - wherein said second reaction chamber (10) is a tube-in-tube (Fig. 1);
  - wherein said first reaction chamber (10) is a tube-in-tube (Fig. 1);
  - an assembly of multiple units for a hydrocarbon reforming process (Fig. 2d).
-

Art Unit: 1764

Regarding limitations recited in claim 11-15 which are directed to a manner of operating disclosed apparatus, the examiner notes that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115.

Instant claim(s) 1-8, 11-18 and 21-22 structurally read(s) on apparatus of Ohsaki et al.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim(s) 1-24 is/are rejected under 35 U.S.C. 103(a) as being unpatentable over Makabe et al. (USP 5,226,928) in view of Ohsaki et al. (USP 5,199,961).

Regarding claim(s) 1-2 and 16, Makabe et al., in Fig. 3A, disclose(s) similar apparatus comprising:

- a vessel having at least one partition wall (36) disposed in said vessel, said at least partition wall (36) dividing said vessel into a plurality of chambers, including at least one combustion chamber (21) and at least one convection chamber (24);
- at least one burner (41) disposed in said at least one combustion chamber (21), said burner (41) adopted to combust a fuel, thereby generating a flue gas having sensible heat;
- communication means (Fig. 3A) between said at least one combustion chamber (21) and said at least one convection chamber (24) whereby at least a portion of said flue gas flows from said

Art Unit: 1764

at least one combustion chamber (21) to said at least one convection chamber (24) at a first location adjacent said first end of said at least one convection chamber (24);

- transfer means (Fig. 3A) whereby at least a portion of said flue gas flows to a second location in said at least one convection chamber (24) adjacent said second end of said at least one convection chamber (24);
- a second reaction chamber (O) adapted to receive a second portion of mixed-feed or another mixed-feed, a substantial portion of said second reaction chamber (O) disposed in said convection chamber (24);
- wherein said second reaction chamber is reforming reaction tube (Abstract).

The reference does not explicitly disclose a first reaction chamber adapted to receive a first portion of said mixed-feed, wherein a substantial portion of said first reaction chamber is disposed in said combustion chamber.

Ohsaki et al., in Fig. 1., teaches a reforming apparatus wherein the reforming reaction tube is disposed in a combustion chamber. Further Ohsaki et al. teaches that it is known to increase the capacity of reforming apparatus by, among others, increasing the number of reforming tubes (C1/L51-C2/L8), and that disclosed arrangement provides high capacity apparatus with high heat recovery efficiency and a lower energy consumption (C1/L4-9) without increasing the size of said apparatus (C2/L23-28).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a first reaction chamber, wherein a substantial portion of said first reaction chamber is disposed in said combustion chamber, as taught by Ohsaki et al., to the apparatus of

Art Unit: 1764

Makabe et al. for the purpose of increasing the capacity of said apparatus without increasing size of said apparatus by increasing heat transfer efficiency.

Regarding claim(s) 3, 17 and 21, Makabe et al. in view of Ohsaki et al. disclose(s) all of the claim limitations as set forth above. Additionally Ohsaki et al. discloses the apparatus further comprising:

- communication means between a first reaction chamber (located in a combustion chamber) and said second reaction chamber (located in a convection chamber), whereby a fluid flows from or to said first reaction chamber to or from said second reaction chamber (Fig. 1).

Regarding claim(s) 4-7, Makabe et al. in view of Ohsaki et al. disclose(s) all of the claim limitations as set forth above. Additionally Makabe et al. and Ohsaki et al. discloses the apparatus wherein:

- the substantial portion of said first reaction chamber is substantially vertical within said at least one combustion chamber (Makabe et al., Fig. 3A and Ohsaki et al. Fig. 1);
- the substantial portion of said second reaction chamber is substantially vertical within said at least one convection chamber (Ohsaki et al. Fig. 1);
- wherein said second reaction chamber is a tube-in-tube (Makabe et al., Fig. 3A and Ohsaki et al. Fig. 1);
- wherein said first reaction chamber is a tube-in-tube (Ohsaki et al. Fig. 1).

Regarding claim(s) 8, 18 and 22, Makabe et al. in view of Ohsaki et al. disclose(s) all of the claim limitations as set forth above but Makabe et al. does not explicitly disclose an assembly of multiple units. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add additional units, since it has been held that mere duplication of the

Art Unit: 1764

essential working parts of a device involves only routine skill in the art (*St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.) and since Ohsaki et al. explicitly teaches an assembly of multiple units (Fig. 2d).

Regarding claim(s) 9-10, 19-20 and 23-24, Makabe et al. in view of Ohsaki et al. disclose(s) all of the claim limitations as set forth above. Additionally Makabe et al. discloses the apparatus wherein:

- further comprising at least one duct, wherein the at least one convection chamber comprises a first convection chamber and a second convection chamber in at least one unit of said assembly of multiple units, and the at least one duct connects the first convection chamber with the second convection chamber (Fig. 3A); and
- at least one convection pass in communication with said at least one duct (Fig. 3A).

Regarding limitations recited in claim 11-15 which are directed to a manner of operating disclosed apparatus, the examiner notes that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).



***Response to Arguments***

7. Applicant's arguments filed on have been fully considered but they are not persuasive.

8. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., two separate and distinct chambers, e.g. reformer tubes) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

9. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., each of the two reaction chambers receiving independent feed) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

10. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine is provided in the reference themselves, specifically, Ohsaki et al. teaches that it is known to increase the capacity of reforming apparatus by, among others, increasing the number of reforming tubes (C1/L51-C2/L8), and that disclosed

arrangement provides high capacity apparatus with high heat recovery efficiency and a lower energy consumption (C1/L4-9) without increasing the size of said apparatus (C2/L23-28).

11. In response to applicant's argument that the references do not address or solve the problems addressed by Applicant's claimed invention, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

#### ***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Basia Ridley, whose telephone number is (703) 305-5418. The examiner can normally be reached on Monday through Thursday, from 8:30 AM to 7:00 PM.


---

Art Unit: 1764

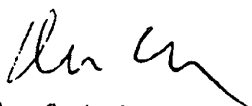
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola, can be reached on (703) 308-6824.

The fax phone number for Group 1700 is (703) 872-9311 (for Official papers after Final), (703) 872-9310 (for other Official papers) and (703) 305-6078 (for Unofficial papers). When filing a fax in Group 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communication with the PTO that are not for entry into the file of the application. This will expedite processing of your papers.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Basia Ridley   
Examiner  
Art Unit 1764

BR  
June 26, 2003

  
Glenn Caldarola  
Supervisory Patent Examiner  
Technology Center 1700